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PROCESSING PORK PRODUCTS IN REA REFRIGERATION LOCKER PLANTS

1. Preparation of Pork for Curing:

- a. Proper conditioning - (removal of all food from trough, at least 24 hours before slaughtering, provide an abundance of water.) This treatment thins the blood and permits free bleeding.
- b. Proper methods of slaughtering for good bleeding.
- c. Scalding, scraping and cleaning the carcass - (when the bristles are removed, the hog is shackled or hung for removing the internal organs).
- d. When all organs are removed, thoroughly wash and rinse the body cavity with cold water. (Hot water lengthens the period of time for removing body heat, and hot water encourages dehydration, and starts freezer burning.)
- e. The bacteria which causes souring and promotes general spoilage is prevalent in most pork. Its growth must be checked promptly. This is accomplished by chilling the two halves of a carcass, at temperatures of 34° to 36° F., at least 48 hours before cutting.
- f. Do not permit an over-lapping of the pork halves. Free air circulation is necessary to prevent the growth of bacteria. Care should be taken so that the fatty bellies, and the hams of warm, freshly slaughtered hogs do not over-lap.

2. Curing Pork:

- a. In the refrigeration plants, pork cuts should be cured at a temperature between 36° and 40° F., preferably not over 38° F., as this appears to be the safest range for good penetration "of the cure."
- b. Uniform temperatures result in an even flavor development.
- c. An even temperature is a safe-guard from chemical action and the growth of microbes.

3. Curing Ingredients:

- a. Salt - salt preserves and dries meat. In excess quantities of salt, flavor will be impaired and the lean muscle meat will be undesirably hard. An insufficient amount of salt will fail to



check the development of bacteria; and the lack of salt will cause putrefaction. Any good grade of clean table or common dairy salt can be used.

- b. Sugar - sugar cure is commonly used for smoked pork products. Sugar cure improves the flavor and the texture of the meat. Brown sugar is considered preferable to cane sugar, but during war times cane sugar has been commonly used.
- c. Nitrates - salt peter (nitrate of pot-ash) is commonly used for "fixing" the bright-red color of lean meat. (For pork products, as well as in curing corned beef) the exact quantity of salt peter should be weighed and mixed thoroughly in the curing mixture. This is known as the 8-2-2 formula. For each 100 pounds of trimmed pork, use 6 to 8 pounds of salt,  $1\frac{1}{2}$  to 2 pounds of sugar, and 2 ounces salt peter.
- d. Pepper - pepper may either be added to the sugar cure, or it may be dusted on the cured meat after it is smoked, to add flavor.

#### 4. Salt Brine - Cure:

- a. For each 100 pounds of meat, use 8 pounds of salt, 2 pounds of sugar, 2 ounces of salt peter, and  $4\frac{1}{2}$  to 6 gallons of water. A large crock, curing vat, or clean, well-shaped, odorless, hardwood barrel may be used for the brine cure.

If a great quantity of pork or corned beef is to be cured, by the brine method, a Salino Meter for testing brine is helpful. The salt cure brine using the 8-2-2 formula should test around  $75^{\circ}$  on the Salino Meter. If a more mild bacon is desired, a weaker brine, testing about  $65^{\circ}$ , will give a good product.

Both brine and meat should be the same temperature ( $38^{\circ}$  F.) when the meat is packed in the crock, vat, or barrel. Heavy pieces of meat, such as the chilled hams and shoulders, should go in the bottom, skin side down, very closely together, but do not squeeze out of shape. The lighter pieces, such as the bacons, are then placed on the hams and shoulders, skin side down, covered with the  $75^{\circ}$  brine until the pieces float. This floating permits a brine contact with all pieces of the meat. A light weight is used to keep the meat below the surface of the brine.

On the fifth, fifteenth, and thirtieth days, the meat should be overhauled; that is, the meat should be removed and the brine should be thoroughly stirred; the meat then replaced. The purpose of overhauling is to remix the brine, and this overhauling insures the brine coming in contact with all parts of each piece of meat.



Four days per pound of meat is usually sufficient for the "brine salt cure" (15# x 4--60 days); bacon requires less time, 1 to 1½ days per pound.

- b. Warm Water is used only for scrubbing salt brine cured meat. A thin scum of white mold normally forms on top of the brine, but if the mold becomes heavy and hard, or the brine has a ropey appearance so that it drips from the tips of the fingers, like syrup, the brine must be changed if the pork products are to be good. Remove the meat, scrub each piece thoroughly with a brush or harsh cloth dipped in warm water and rub vigorously to remove any crusty mold which may have adhered to the pieces. The container must be thoroughly scrubbed, and should be scalded before the washed meat is repacked. New brine, using the 8-2-2 standard mix, is added as if this were the original process. If the brine becomes ropey, or the mold has become heavy and hard within one week, the cure should be weakened to a 70° brine, instead of 75°; if more than two weeks, use 65° brine. The original curing schedule is used cutting the brine 5° according to the number of weeks.
- c. Most refrigeration plant managers use the dry salt cure for curing meat as the REA-financed plants have not provided curing vats. However, particularly in the South, brine methods of curing meat are considered preferable by many Research Specialists. (The Federal Meat Inspection Act prohibits the use of liquid smoke, smoked salt, or any other light preparation intended as a substitute for smoke.) F. B. 1186

## 5. Dry Salt Cure:

- a. Five pounds of salt is usually sufficient for 100 pounds of meat. Care should be taken to prevent the salt from falling off. In the Southern States 8 pounds of salt to 100 pounds of pork is considered to be a safer quantity. More than 8 pounds of salt to the 100 pounds of meat should not be used as a greater quantity injures the flavor and makes the lean streaks of the bacons, or the lean muscle meat, of the larger pieces, too hard.

Salt is packed between and around the skin side down pieces of meat, which are usually placed one on top of the other, on the curing shelves, in the meat curing room.

If the correct quantities of meat and dry salt have been used the meat shall have absorbed all of the salt cure within the specified days, per pound, and there will be no surplus salt to brush off.

- b. Salt cured meat if properly cared for will not mold.
- c. Remove excess salt, if any, with brush or rough cloth dampened in luke warm water.

## 6. Dry Sugar Cure:

The 8-2-2 formula is used for dry sugar cure and this sugar cured meat



is usually smoked, primarily to give the meat its familiar color, flavor, and odor, as well as, smoking is used for the purpose of evaporating some of the moisture from the meat.

- a. Applying the dry sugar cure -- mix all dry ingredients thoroughly and divide by weight, into two equal parts. Part one is used for the first "rub in." Part two is divided equally using half for "rubbing in" on the third day, and the remainder is "rubbed in" on the tenth day.

1. Sprinkle a little of the mixture in the bottom of the barrel.
2. Select the larger pieces first, such as hams and shoulders. With an ear of the hog or a strong piece of uncured leather thoroughly "rub in" the cure on the meaty sides. Force some of the cure into the hock and along the cut face of the butt. Care should be taken to not injure the muscle on the butt bone. Place in the bottom of the barrel, skin side down. Repeat this process until all pieces to be sugar cured have been thoroughly treated with the sugar cure.

On the third day the meat is removed from the barrel and the processing is handled as it was originally, using half of the remainder of the cure. On the tenth day the remainder of the dry sugar cure is "rubbed in."

3. Two days per pound is considered the standard curing time for the dry sugar cured method. For instance, a ten pound ham would require 20 days; a twenty-five pound ham would require 50 days.
4. At the end of the required number of days in the dry sugar cure, the meat is removed from the container, wiped with dampened cloth, hung in the refrigerator room to air cure for a period of at least two weeks.
5. The practice of pumping concentrated brine into curing meat is followed by many of the REA refrigeration plant managers, as they consider this to be a method of speedier penetration of the cure. In following this practice care should be taken to prevent injecting too large a quantity. However, it is the opinion of some Research Specialists that where temperatures are too high, or the meat is not in good, sound condition, this method may, or may not prevent spoilage.

## 7. Smoking Cured Meat:

In the Southern States meat to be aged, or used during the summer months should be smoked slowly. Ventilators should be left open to



permit escape of moisture. A heavy fog of smoke is not necessary; if too heavy, the meat darkens to a deep brown in 12 to 18 hours. In the Southern States meat to be removed from the plant as soon as it is dried and cured, and smoked should be given from one to several weeks of intermittent smoking, at temperatures from 70° to 90° F., to prevent molding when it is taken to the farm-home for storage.

- a. At the end of the curing period when meat is removed from the salt brine or sugar cure, and an excess of grease, or the cure remains on the meat, each piece should be thoroughly brushed and wiped off with a rough cloth, dipped in warm water, brushed vigorously. If the meat is scrubbed with an abundance of water, more time is required for dripping or drying out before the smoking period. (Some specialists recommend the soaking method for a period of two hours before smoking)
- b. Some refrigeration plant managers in the Southern States hang meat in the smoke room from 7 to 14 days, prior to smoking, at a temperature of from 70° to 80° F. Plant managers claim this method speeds up evaporation and prevents molding.

#### 8. Hanging Meat:

- a. Run a stout thong or string through the shank or hanging hams and shoulders; to keep bacon square a wooden or wire skewer is usually run through the flank end of the strip, and the string is inserted just below the skewer in the center of the strip. If a stringing needle is unobtainable an opening is easily made with a boning knife using a wire hook to pull the string through.

#### 9. Testing Smoked Meats for Thorough Smoke Penetration:

- a. Souring is easily detected by its odor when the warm meat is removed from the smoke room.
- b. Taint will be noticeable a week or two after smoking.
- c. A "meat trier" or "ham trier" may be used to test each heavy piece of meat, such as hams and shoulders. (The "trier" resembles a narrow 10" harness awl.) An improvised "trier" may be made from a length of stiff wire, sharpened at one end.
- d. Run the "trier" along the bone, to the center, from both loin and hock ends. If the meat is sound, the "trier" will give off a sweet odor.
- e. If the "trier" carries an unpleasant odor, the meat should be cut open and examined carefully for spoilage. If putrefaction is evident, the entire piece should be destroyed.



f. Try shoulders under the blade-bone and in the shank.

10. Wrapping and Storing Smoked Meats:

(If pepper is desired as a flavor rub into the meat before the meat is wrapped; ground black pepper, with or without red pepper, may be used depending upon the individual desires.)

When cool the smoked meat is ready to be wrapped. Wrapping protects the meat from insects and excludes light and air. (It is light and air that speed the development of rancidity in the fat.)

11. Wrapping:

Cellophane and Stockinette are the best wrapping materials for smoked meat. If unobtainable use treated butcher's paper, wrap very tightly and put into muslin bags securely tying the top of the muslin bag, to prevent the entrance of insects. In the Southern States where it is a problem to keep cured meat on the farm a further protection can be obtained by painting the muslin sack with yellow wash.

12. Preparation of Yellow Wash:

3 pounds barium sulphate  
1 $\frac{1}{4}$  ounces of yellow ocher (mixed in 1 quart of water)  
1 ounce of dry glue  
6 ounces flour (made into a thin flour-paste)

Place 4 quarts of water in a vessel; add flour. Mix ocher with the quart of water, in a separate vessel; add the glue; thoroughly dissolve and pour into the flour and water mixture, bringing to a boil; add the barium sulphate slowly; stir constantly. This wash should be made in advance of its use. Apply to the muslin bag with a paint brush.

13. Storing Meat on the Farm:

Store refrigerator plant cured meat in a dry, dark, cool, well-ventilated place.

Properly conditioned animals slaughtered and bled properly; cooled in a temperature between 34° and 38° F., cured and smoked properly, and sacked using the precautionary methods to prevent the encroachment of insects; hams, shoulders, and bacons are kept indefinitely and will develop the mellow flavor characteristic of good smoked products.



## Lard Rendering:

Cook leaf fat, back fat, and fat trimmings together. The caul and ruffle fat from the organs yield a darker product which, unless the fat has been removed carefully, washed, and chilled promptly, will give a most disagreeable flavor. Consequently the two types should not be rendered together.

The smaller the pieces of fat, the more quickly the rendering will be accomplished. Many managers grind the fat which they claim shortens this operation to half the time when the fat is cut into pieces.

Place just enough fat in the caldron to cover the bottom, and stir until most of the pieces are covered with liquid fat, then add the remainder of the pieces or the ground fat. Sticking and scorching must be prevented in order to have a white lard. Stirring is most necessary and the temperature must not be permitted to go above 255° F.

At the beginning of the fat rendering the temperature will be 212° F. As the moisture contained in the fat tissues evaporates, the temperature will rise, so care must be exerted to prevent going over 255° F. Many managers claim they have a much firmer and whiter product if a temperature of 240° F. is maintained.

As rendering nears completion the floating particles of fat will gradually sink to the bottom of the caldron. Great care should be taken to prevent small particles from sticking to the bottom as scorching will be the result and the lard will be any of the shades of brown depending on the time the particles have scorched. The odor and flavor will also be strong. Tan or brown lard are objectionable products. White lard keeps better, and it will not become rancid as quickly as the scorched lard.

The lard should be permitted to cool slightly before the kettle is emptied. Most caldrons are equipped with a siphon which permits the careful removal of the liquid fat. The fat covering the cracklings should be removed with them and if a press is not available, use several layers of cheese cloth in a long handled wire basket for straining the remainder of the lard. Gather the cheesecloth corners together and press remaining fat from the cracklings.



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